

Banda, and Kayeli, and on the following day at Kairatu. Villages on the beach were overwhelmed by the sea. At intervals of about twenty minutes the sea receded to a distance of 300 yards from low water mark, and then returned to overflow to a depth of 34 feet the broad plain near the beach, fifteen miles west of Kayeli. This phenomenon does not appear to have been general, but to have confined itself to the locality mentioned.

EARTHQUAKE shocks were felt on August 26 in the valley of the little river Mürz, in Styria. They caused no damage beyond loosening the foundations of a few cottages. Several shocks were felt in the same district last May.

THE *Nacion* of Guayaquil gives details of the eruption of the volcano of Cotopaxi early on the morning of July 23. It states that about one o'clock in the morning people were awakened by a sound as of heavy artillery fire, apparently from guns of the heaviest calibre. The explosions followed one another with wonderful rapidity, sometimes causing a continuous roar, shaking the earth and causing the windows and the doors of the houses to rattle. At Chimbo, which is situated almost at the foot of the volcano, there was what the residents along the river Yana-Yacu call an "aluvion." The phenomenon so-called is really the stream of lava which descends the mountain sides, melting the snow with which it is covered, and pouring down a tremendous mass of lava, mud, stones, and all obstacles encountered in its progress. Investigations during the day showed that the shocks produced by the explosions during the night were exceedingly heavy. The smoke hung like a pall over the face of the country, and the steady fall of ashes thrown constantly out of the terrible crater intensified the darkness. Accounts from Latacunga state that the eruption began with a terrible storm. The damage done was considerable, but the number of victims is not known. A similar catastrophe occurred in June 1877.

THE "Bureau Scientifique Central Néerlandais," established in 1871 at Haarlem, after the death of its first Director, the lamented Prof. E. H. von Baumhauer, has been taken in hand by Dr. P. P. C. Hoek, at Leiden. The Bureau is in relation with the Smithsonian Institution, Washington, the "Ministère de l'Instruction publique en France," the "Commission des Echanges Internationaux à Bruxelles," with bureaux in Christania, Stockholm, Copenhagen, &c. Packages sent as *donations* or *exchanges*, and destined for Dutch learned societies or scientists, henceforth are to be sent to the new Director at Leiden or to be delivered to the agent of the Bureau at London *free of expense*. The agents of the Bureau are Messrs. Williams and Norgate, 14, Henrietta Street, Covent Garden, London.

THE additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus* ♀) from India, presented by Mr. H. J. Thimbleby; a Binturong (*Arctictis binturong* ♂) from Malacca, presented by Mr. T. H. Haynes; a Great Kangaroo (*Macropus giganteus*) from New South Wales, presented by Mr. A. McIlwraith; two Golden-crowned Conures (*Conurus aureus*) from South-East Brazil, presented by Mr. Cuthbert D. Middleton; a Common Cuckoo (*Cuculus canorus*), British, presented by Mr. R. B. Spalding; two Javan Sparrows (*Padda oryzivora*) from Java, presented by Miss Coleman; a Black-headed Gull (*Larus rubicundus*), European, presented by Mr. Humphries; a Horned Lizard (*Phrynosoma cornutum*) from Texas, presented by Miss Simpson; a Common Chameleon (*Chamaleon vulgaris*) from North Africa, presented by Master Cecil Guy Dart; a Robben Island Snake (*Coronella phocorum*) from Robben Island, South Africa, presented by the Rev. G. H. R. Fisk, C.M.Z.S.; a Macaque Monkey (*Macacus cynomolgus*) from India, a Siamese Blue Pie (*Urocissa magnirostris*) from Siam, an American Black Snake

(*Coluber guttatus*) from North America, a Smooth-headed Capuchin (*Cebus monachus*), a Squirrel Monkey (*Chrysotrix sciurea*) from South America, deposited; two Axolotls (*Siredon mexicanus*) from Mexico, purchased; fourteen Striped Snakes (*Tropidonotus sirtalis*), born in the Menagerie.

ASTRONOMICAL PHENOMENA FOR THE WEEK, 1885, SEPTEMBER 6-12

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on September 6

Sun rises, 5h. 22m.; souths, 11h. 58m. 8'3s.; sets, 18h. 34m.; decl. on meridian, 6° 18' N.: Sidereal Time at Sunset, 17h. 38m.

Moon (New on September 8) rises, 2h. 11m.; souths, 9h. 44m.; sets, 17h. 6m.; decl. on meridian, 14° 3' N.

Planet	Rises h. m.	Souths h. m.	Sets h. m.	Decl. on meridian
Mercury ...	4 53 ...	11 28 ...	18 3 ...	6 14 N.
Venus ...	8 29 ...	14 0 ...	19 31 ...	6 23 S.
Mars ...	0 32 ...	8 40 ...	16 46 ...	22 14 N.
Jupiter ...	5 30 ...	12 6 ...	18 43 ...	6 31 N.
Saturn ...	23 18* ...	7 27 ...	15 35 ...	22 23 N.

* Indicates that the rising is that of the preceding day.

Sept.	h.	
8 ...	4 ...	Mercury in conjunction with and 0° 27' south of the Moon.
8 ...	— ...	Total eclipse of Sun, visible only in regions near the south pole.
8 ...	22 ...	Jupiter in conjunction with Sun; also in conjunction with and 1° 57' north of the Moon.
11 ...	9 ...	Mercury stationary.
11 ...	10 ...	Venus in conjunction with and 2° 27' south of the Moon.

GEOGRAPHICAL NOTES

MR. GARDNER, British Consul at Newchwang, publishes with his annual trade report this year (China, No. 6, 1885) a most interesting account of his consular district, which embraces the whole of Manchuria. It contains an area of about 300,000 square miles and a population estimated by the Roman Catholic missionaries at 15,000,000. Its boundaries are, on the north, the Amour, separating it from Eastern Siberia, on the east the Ussuri River and Sihoti Mountains separating it from the Russian province of Primorsk, on the south the Tiumen and Yalvo Rivers separating it from Corea, the Yellow Sea and the Gulf of Liao-tung, on the west China, Mongolia, and Russian Siberia. The first part of the report deals with the ordinary trade and productions of Manchuria, and gives a summary of the statistics of foreign trade since the port of Newchwang was opened to trade in 1861. The second part is devoted to geographical notes on Manchuria, its three provinces, Heh-lung-Kiang (or Sagalien), Kirin and Fengtien being taken separately. The history, government, military force, and divisions in towns are the heads under which these provinces are described. Various appendices contain an account of a journey from Moukden to San-sing, an essay on Christian missions in Manchuria, and a sketch of the botany of South Manchuria by Dr. Morrison. The latter is, from a scientific point of view, the most important part of the report. The lists given are defective, as the greater part of Dr. Morrison's collections remain unidentified, there having been no opportunity of visiting herbaria or consulting published accounts of Northern Chinese plants.

THE report of the Resident in the State of Selangore in the Malay peninsula for the past year contains some curious information with regard to "aboriginal tribes" called the Sakeis, who number between 700 and 800. They are in nine divisions, under head-men called Batins, and they live mainly by collecting gutta, rattans, and other jungle produce. As far as is known they have no form of religious worship, but they are very superstitious, believing in good and bad omens, the sacred character of certain birds, and they always desert a village as unlucky on the death of any member of the tribe. They tattoo figures on their arms, but apparently only for the sake of ornament, and

do not use any specially significant figures, peculiar to each tribe, analogous to the totems of the North American Indians. They consider no kind of edible food unclean, but eat even monkeys, snakes, and scorpions, which they kill by means of a blow-pipe, throwing a dart poisoned with the juice of the Ipoh or Upas tree. For large game they use a kind of cross-bow, consisting of a sharpened bamboo spear placed horizontally on a grooved log, and a bent sapling fastened back by a rattan cord. This cord is stretched across a path in the jungle, and, on being touched, releases the sapling with sufficient force to drive it completely through a deer's body. The Sakeis live in small huts built of bamboo and thatched with leaves of the Bertam palm, raised eight feet or more above the ground. They are shy and easily frightened, but are quite harmless, and are gradually becoming accustomed to Europeans, by whom they are employed to track game and to cut paths through the jungle. They are smaller in stature, but are otherwise very similar in appearance to the Malays, from whom they differ, however, in usually having wavy instead of straight-growing hair. A few Malays are attached to every Sakei community to act as go-betweens in the sale of their produce, and the officials have received special instructions to protect these aboriginal tribes.

THE last issue (Bd. xxviii. Nos. 7 and 8) of the Vienna Geographical Society contains a paper by Dr. B. Jirus describing several visits made by him to the Scoglios, or small reefs off the Dalmatian coasts.—Dr. Polek writes on the colonies of Lipporwans, or Ras Kolniks, Russian schismatics who fled in the middle of the seventeenth century into Bessarabia and Moldavia, which they subsequently left for Bukowina in a romantic way. The writer discusses the history of their flight, and describes their manners and mode of life. The charm of mystery hangs around this small sect of the Greek Oriental Church.—Mr. H. Polakowsky discusses the historical value of the Spanish heroic poem "Araucana," recording the struggles the Spaniards for the possession of the central part of the present Republic of Chili. The object of the author of the paper is to draw attention to this poem, and its translation into German, and by a complete critical examination to separate the historical and actual from the poetical and imaginative.—Herr Baumann describes the projected geodetic work of Dr. Lenz's Congo expedition, and also writes from the vessel taking out the expedition on the present position of the question it is going out to solve.

THE Geographical Society of Hamburg has published a memorandum showing the territorial extent of the recent German annexations in the Pacific Ocean. Reduced to English measurements the German estimates are as follows:—Kaiser Wilhelm's Land (German New Guinea), 34,508 square miles; New Ireland, 3,398·8 square miles; New Britain, 9,348·8 square miles; the Bismarck Archipelago, 15,261·6 square miles: in all about 65,512 English geographical square miles. The same authority estimates the area of New Guinea taken under British protection as 65,517·76 square miles, or about the same as the total of the German annexations in the Pacific, and in each case the area acquired is rather more than twice that of Ireland.

THE *Indépendance Belge* announces that the two Portuguese explorers, Capt. Capello and Commander Ivens, who started last year upon an expedition across Africa, have reached the Cape after a most adventurous journey. Leaving Mossamedes in March, 1884, with an escort of 120 men recruited along the coast between that place and St. Paul de Loanda, they reached Quillimane, upon the eastern coast, to the south of Mozambique, in May, 1885, after having discovered the watershed whence the rivers of Central Africa flow north and east towards the sea. They travelled over 4500 miles of territory, and they are said to have discovered the sources of the Lualaba. They also came upon a region which is extraordinarily rich in copper, this being the district of Yaranganga, situated between the Lualaba and the Luapala. The chief of the country, however, was so hostile that they could not visit it in detail, but they think that as this was the first visit of white men his hostility may be appeased by judicious presents. Messrs. Capello and Ivens found that the tsetse fly was very abundant. The *Indépendance Belge* adds that the two explorers started again at the beginning of last month for Mossamedes, with the intention of returning to Europe by way of the Congo.

THE Calcutta correspondent of the *Times* states that the Government of India has conferred the title of Raj Bahadur and a grant in perpetuity of a rent-free village in Oude on Pundit Kishen Singh Milwal, an *employé* of the Survey

Department, who is well known to all geographers for his explorations in Thibet, which have been published under the initials "A. K."

ON August 10 Col. Lockhart was at Hargil, near Gilgit, and is now probably marching to Chilval. His mission is expected to largely increase our knowledge of the country towards the upper waters of the Oxus.

THE IRON AND STEEL INSTITUTE

THE autumn meeting of the Iron and Steel Institute is being held in Glasgow this week, under the presidency of Dr. Percy, F.R.S.

On Tuesday, after the President had acknowledged the welcome given to the Institute by the Corporation of Glasgow and referred to the depression of trade, due, in his opinion, to over-production, and to be remedied only by a diminution of production or increased consumption, the three following papers were read, of which abstracts are given below.

On the Iron Trade of Scotland, by Mr. F. J. Rowan.—The author separates the history of iron-making into two periods—the *empirical*, characterised by rude and imperfect appliances; and the *scientific*, in which exact methods of working are employed, the introduction of the hot-blast in 1830 closing one and opening the other period. At this period there were in Scotland 27 blast-furnaces making 37,500 tons; at present there are 92 in blast, with an average production of 200 tons per week each, and 269 puddling-furnaces at work, each producing annually 732 tons. There has been a steady increase in the production per furnace, and reduction in the amount of coal used to produce a ton of pig iron, the latter result being due to the introduction of closed tops, higher furnaces, and higher temperatures of blast. About two-thirds of the coal raised have been from the coal-measures, and one-third from the carboniferous limestone series. It is remarkable that the increased production of coal that has recently taken place has been accompanied by a reduction in the proportionate number of persons employed due to mechanical haulage and other improvements both below and above the surface. The increased manufacture of open-hearth steel, which employs a large quantity of Spanish and African ore, has caused a diminution in the output of ironstone, and has also had an influence on the pig-iron trade; this, however, has been compensated for by the malleable iron tube manufacture, the manufacture of boiler tubes having increased ten times in the last twenty-five years. The author claims for Scotland a good record of advancement and improvement in connection with the iron trade—the first cylinder-blowing engine, the first use of raw coal in the blast-furnace, the discovery of blackband ironstone by David Mushet, the invention of the hot blast by Neilson, and the collection and utilisation of the gases from the tunnel-head. The spirit of enterprise is still potent among Scottish ironmasters, and it is hoped more prosperous times will soon reward and further stimulate the energy and ability which are to be found in all branches of the iron trade in Scotland.

The Rise and Progress of the Scotch Steel Trade, by James Riley.—The author first makes a short reference to the manufacture of cast steel in crucibles, which is carried on only to a very small extent.

As regards the Bessemer process, the first trial, which proved unsuccessful, was made in 1857, at the Coats Iron Works, by Mr. T. Jackson, the apparatus being fitted up from the drawings and letterpress in the *Illustrated London News*.

Other attempts on a small scale were afterwards made to introduce the manufacture, but since the application of the basic lining to the Bessemer converter, by which the pig-iron of the district will become available, the process has again received attention, and a large production is anticipated.

The history of the Scotch steel trade really commences with the formation, in 1871, of the Steel Company of Scotland, which manufactured open-hearth steel by the processes of the late Sir William Siemens, their output being principally boiler and ship plates, angles, bars, castings, and forgings. The extension of manufacture in these directions has been due to the fact that the Admiralty in 1875 declared for steel, "giving Siemens's steel a preference," and that in 1879 concessions were made to steel by Lloyds' and the Board of Trade, which has caused a great demand for shipbuilding and for the purposes of the civil engineer, who has recognised that by the use of steel, difficulties